Lumaestro Manual

Automatic light shows that follow the music. Patch your fixtures, and Lumaestro works out what every channel does, builds a set of looks and plays them to the beat over Art-Net.

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QMIX MEDIA

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Light and Sound

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1 What Lumaestro does

Lumaestro is a light controller for people who would rather not program every cue. You tell it which lights are connected and at which DMX address. From the fixture definitions it works out which channel is the dimmer, the colour, the pan and tilt, the gobo wheel and so on. Then it generates a collection of **looks** (a movement, a colour scheme, an intensity effect and a beam setting combined) and runs them in time with the music it hears.

Listens to the music

Finds the beat and the tempo, measures how energetic the music is and spots drops.

Runs the show for you

Picks a calm, groove or peak look and changes look on musical phrases.

Lets you take over

Give any group its own movement, colour, intensity or beam with one tap, with a crossfade.

Works from a phone

The control page runs in a browser, on the PC or on a phone or tablet on the same network.

Lumaestro sends **Art-Net** and **sACN** over the network, DMX straight out of a **USB dongle**, drives **LED strips and matrices** pixel by pixel and can include **Philips Hue** lamps and **Nanoleaf** panels. It follows the tempo from the microphone, or straight from the DJ with **Ableton Link** or Pioneer **Pro DJ Link**. Fixtures are described in the open Open Fixture Library format (JSON). Lumaestro ships with more than 2,200 fixture definitions, and you can make your own definitions with the built-in fixture editor.

2 What you need

- A Windows 10 or 11 PC. Lumaestro is one program file, `Lumaestro.exe`; nothing else needs to be installed. **Lumaestro is lightweight**: it does not need a fast computer. It runs fine on a small tablet PC such as a Microsoft Surface 3 with an Intel Atom processor, so an old laptop or a mini PC next to the desk is enough.
- An **Art-Net or sACN node** (or a DMX interface that understands one of them) on the same network as the PC, connected to your lights with DMX cables, **or a USB DMX dongle** (Enttec DMX USB Pro, DMXking ultraDMX, Eurolite USB-DMX512 (PRO), Enttec Open DMX, uDMX and the many compatible cables; see USB DMX dongles). Both can be used at the same time.
- **Fixture definitions** are included: more than 2,200 fixtures from over 200 manufacturers. Missing fixtures can be made with the built-in fixture editor.
- Optional: a **microphone or line-in** that hears the music. Without audio Lumaestro runs on its own beat clock, which you set with **TAP**.

> **Close other lighting software while Lumaestro runs.** Two programs sending to the same lights at the same time makes the light flicker.

3 Installing and starting

1. Download `Lumaestro.exe` from qmix.nl/lumaestro. Make a folder for Lumaestro, for example `C:\Lumaestro`, and put `Lumaestro.exe` in it. Lumaestro keeps its settings and fixtures next to the exe, so choose a folder you can write to (not *Program Files*).

2. Double-click `Lumaestro.exe`. On the first start it unpacks the fixture library into a `fixtures` folder next to itself (a few seconds) and creates a `data` folder for your settings.

3. The status window opens, the Lumaestro icon appears in the taskbar next to the clock, and your browser shows the control page at `http://localhost:8800`.

4. Windows may ask whether Lumaestro may use the network. Allow it on private networks, otherwise phones and tablets cannot reach the control page. Windows SmartScreen may warn about an unknown program the first time: choose *More info* → *Run anyway*.

From a phone or tablet

The status window shows a second address, for example `http://192.168.1.20:8800`. Open it on any phone or tablet on the same Wi-Fi network. Several devices can control Lumaestro at the same time.

Console mode

Start `Lumaestro.exe --no-gui` from a command prompt to run without window and tray icon. Stop it with `Ctrl` + `C`. Other options: `--no-audio` (do not open the microphone), `--no-browser` (do not open the browser), `--port 8900` (another port).

If Lumaestro is already running when you start it again, it tells you so and simply opens the control page.

4 Quick start

1. **Art-Net.** Go to **Settings** → **Art-Net output** and enter the address of your node, or the broadcast address of its network (for example `192.168.4.255`). **Find nodes** lists nodes that answer.

2. **Patch.** On the **Patch** tab, search the fixture library and add your fixtures with their mode and DMX address.

3. **Check the roles.** Every fixture gets a role (Mover, Wash, White, Dimmer ...). A fixture marked *not recognised* needs its channels described in the fixture editor.

4. **Music.** Under **Settings** → **Music input**, pick the microphone or line-in that hears the music.

5. **Play.** Go to the **Show** tab. With **AUTO SHOW** on, the show runs by itself; switch it off to play by hand. Use the groups and the programmer to take over parts of it.

6. **Point the heads.** Before a show, set the home position and the movement range of your moving heads so they never shine into the audience.

A typical evening, from set-up to the last song

1. **Set-up.** Hang and connect the lights, switch on the Art-Net node and start Lumaestro. Check the Art-Net chip (green) and that every fixture reacts: press **FLASH** – everything with FX on goes to full white.

2. **Load or make the show.** At a known venue, load its show (Settings → Shows). At a new venue, patch the fixtures, then set the movement ranges with Aim so no head

points into the audience, and place the fixtures in the preview with *Edit layout*. Save the show.

3 **Front light.** Give the white/front-light group its colour temperature and level, then click its 📌 button twice to lock it (🔒): it now stays exactly as it is whatever AUTO SHOW, scenes, presets, FLASH or the master do; only its own level slider works.

4 **Sound check.** Under Settings → In & output, choose the audio input and set the sensitivity so the energy bar moves with the music and only fills up when it gets loud.

5 **Prepare moments.** Make scenes for fixed moments (walk-in, first dance, speech, encore) on the *Scenes* page, with the moving heads aimed where you want them. Put them on a MIDI controller or a presentation clicker if you like. Save the show again.

6 **During the evening.** Leave AUTO SHOW on: it follows the music by itself. Use FLASH and STROBE for accents, the master and group faders for the level, and a scene or an aim position for a special moment. Switch AUTO SHOW back on afterwards.

7 **End.** Press **Stop** in the status window or *Quit Lumaestro*: all channels go to zero. Or shut the PC down from your phone (PC power).

5 Status window and tray icon

The small Lumaestro window shows whether the show is running and what it is doing. Lumaestro also puts its icon in the taskbar next to the clock (open the little arrow there if you do not see it).

- **Closing the window does not stop Lumaestro**: it keeps running in the tray. Double-click the tray icon to show the window again.
- Right-click the tray icon for **Show window**, **Open control page**, **Start show** / **Stop show** and **Quit Lumaestro**.
- **Start** / **Stop** in the window switches the show on and off: the light output and the web server (control page) together. Stopping sends all channels to zero, so the rig goes dark.
- **Quit Lumaestro** stops the show and closes the program completely.

ITEM	MEANING
Title and dot	"running" or "stopped". The dot blinks on the beat while the show runs, and turns red when Lumaestro could not start.
Control page	The address of the control page on this PC. Click it to open it.
Phone / tablet	The address to use on other devices in the network.
Tempo	Current BPM; "(fixed)" when you set it with TAP.
Look	The look that is playing, and whether AUTO SHOW is on.
Art-Net	Where DMX is sent, or the error when sending fails.
Audio	"listening", "silent" (input works but hears nothing) or the error.
Fixtures, Fixture library	How many fixtures are patched and how many definitions are available.
Fixture icons	Every fixture as a small icon of what it is (moving head, par, LED panel, bulb, fog machine, effect) in its live colour and brightness; more rows when there are many fixtures.

Buttons	**Start** / **Stop**, **Open control page** (starts the show if needed), **Blackout** (all lights off, red while active) and **Quit Lumaestro**.
Log	Messages from Lumaestro, useful when something does not work.
Bottom	Qmix Media and Daniel Vollers – Light and Sound, the version and a link to qmix.nl.

6 The control page at a glance

Everything is controlled from the control page in a browser: on the PC at `http://localhost:8800`, or on a phone or tablet with the address from the status window. Several devices may be open at the same time; they all see the same show and every change shows up on all of them within a fraction of a second.

The bar at the top

ITEM	WHAT IT SHOWS OR DOES
Live control / Scenes / Setlist and the icons at the top right	The tabs **Live control** (the Show page, where you play), Scenes and Setlist; the name of the page you are on is in the middle of the bar; at the top right the colour icons for **Patch** (branches) and the **Fixture editor** (a moving head), the pen (Show page) and the gear ⚙ for **Settings**. **Show** is for playing, **Scenes** for building scenes, **Setlist** for the songs of the evening, **Patch** for the fixtures and groups, **Fixture editor** for fixture definitions and **Settings** for everything that is set up once.
Show: …	The name of the show that is loaded ("not saved" when you never saved). Click it to go to Settings → Shows.
Audio chip	Green **Audio** while the input is listening; orange **Audio: silent** when it works but hears nothing; orange **No audio** when listening is off; red **Audio error** when the input could not be opened. Hover over it for the device name or the error.
Art-Net chip	Green with where DMX is sent (for example `Art-Net → 192.168.4.255`, or `+ sACN` when sACN is on too); red when sending fails (hover for the reason).
Online / Offline	Whether this page is connected to Lumaestro. When it says Offline (Lumaestro stopped, or the Wi-Fi dropped), the page reconnects by itself as soon as it can.
Pen (Show page)	Arrange live page: choose the blocks of the Show page, their order and size (see Arrange the live page). Only with the edit password.
Full screen button	The square at the far right fills the whole screen with the control page, without the browser's address bar and tabs: handy on a tablet or a laptop at the desk.

Click it again (or press Esc) to go back. On an iPhone the browser does not allow full screen, so the button is not there.

The green update bar

Appears at the very top when a newer Lumaestro is available: **Update now**, **Later** or **Skip this version**. See Settings → Updates.

Using it on a phone

- Panels stack below each other; scroll down for the groups, the programmer and the looks.
- Hold buttons (FLASH, STROBE, FOG, Flash custom buttons) work with your finger on them; let go to release. If the phone locks or the browser goes to the background, they are released automatically.
- Hide the preview (**Hide preview**) on a small phone to save battery and room; it is remembered per device.
- Choose the layout **Phone** at the bottom of the Show page: only the blocks you need during the evening, with big buttons (see Arrange the live page).

As an app on the home screen

The control page can live on the home screen of a phone or tablet like an app, with the Lumaestro icon and without the address bar.

- **iPhone / iPad (Safari):** open the address of the control page, tap the share button and *Add to Home Screen*. It opens full screen, also on an iPhone where the full screen button is missing.
- **Android (Chrome):** menu ⋮ → *Add to Home screen*. Because Lumaestro runs on your own network without https, Chrome opens it as a shortcut with the address bar; press the full screen button at the top right to hide it.
- The app opens the address it was made with. When the Lumaestro PC gets another IP address, make the icon again (or give the PC a fixed address in the router).
- On an iPhone the app keeps its own login: log in once more inside the app when passwords are used.

Arrange the live page

The Show page is made of **blocks**: Tempo, Energy, the action buttons, Master, AUTO SHOW, your buttons, the stage preview, Setlist, Scenes, Aim, Groups, the programmer, the looks, movement

size & speed and the auto show colours. A **layout** says which blocks are on the page, in which order and how wide. Lumaestro comes with three:

LAYOUT	FOR
Standard	Everything, as on a laptop or PC.
Touchscreen	A touchscreen at the desk: your buttons at the top, then the action buttons, AUTO SHOW, master, setlist and scenes, all with bigger buttons and sliders.
Phone	Only what you need during the evening, big enough for a thumb.

- **Every device picks its own layout** with **Live page layout on this device** at the bottom of the Show page (or Settings → Look & about). The touchscreen can show *Touchscreen* while the laptop shows *Standard*. A link with `?layout=Touchscreen` at the end opens a device straight in that layout.
- The **pen** at the top right of the Show page (*Arrange live page*, needs the edit password) changes the layouts. Every block gets a bar: grab it by ⠿ and the block itself moves with your mouse or finger; the other blocks make room and an outlined empty place shows where it will land. Let go to put it there. **−** / **+** make it narrower or wider (⅙, ¼, ⅓, ½, ⅔ or the full width), ✕ hides it. Hidden blocks are listed at the top; click one to put it back.
- In the bar at the top: pick the layout to change, rename it, tick **Touchscreen** for bigger buttons, **+ New layout** (starts as a copy), **Delete layout** and **Built-in layouts** (back to the three Lumaestro comes with). **Save layouts** stores them for every device; **Cancel** forgets the changes.
- On a narrow screen blocks get wider by themselves (on a phone most take the full width), so one layout works on several screen sizes.
- The layouts are saved with the show.

Managing layouts

Under **Settings** → **Look & about** → **Live page layouts** every layout has a row:

- Type in the name to **rename** it. **Use here** makes this device use it (the one in use shows ✓ *used here*).
- ▦ **Arrange** opens it on the Show page to move, resize and hide blocks; **Duplicate** makes a copy to start from; ✕ deletes it (devices that used it switch to another layout).

- + **New layout** asks for a name, starts as a copy of the layout this device uses and opens it to arrange.
- ⬇ saves one layout as a file, ⬇ **Export all** all of them; ⬆ **Import…** adds the layouts from such a file (a layout with a name that already exists gets "(2)" after it). Handy to take your touchscreen layout to another Lumaestro.

7 Patching fixtures

The patch is the list of connected fixtures: what they are, in which mode, and at which DMX universe and start address.

Add fixtures from the library

1. Type part of the manufacturer or model in the search field, for example `cameo spot`. Your own definitions are marked "yours".

2. Click the fixture, then choose the **mode** (the channel mode set on the fixture itself), the **universe** and the **start address**. The next free address is filled in for you, also again after each fixture you add. Under the address you see where the last fixture in that universe ends, which addresses the new fixture(s) will take, and a warning when they would overlap another fixture or do not fit in the universe.

3. Set **Count** to add several identical fixtures in a row; their addresses follow each other.

4. Press **Add to patch**.

The patch table

- **The order of the list** is the order the fixtures hang in, from left to right. Chases, waves and the phase of movements run through a group in this order, and the automatic layout of the preview (and of the Art-Net Viewer) places them in this order too. Drag a fixture by ⠿, or move it one place with ▲ ▼; **#** after the group shows its place in that group. **Sort by address** puts the list back in DMX address order.
- **Name, universe and address** can be changed directly in the table.
- **Ch** shows the number of channels and the addresses the fixture takes (for example *33–40*). The line above the table shows per universe how far it is used and the next free address.
- A red line warns when the address range **overlaps** another fixture.

- **Role** shows how Lumaestro uses the fixture, with the features it found (dimmer, colour, strobe, gobo, prism, colour temperature).
- **Group** chooses the group of the fixture (see Groups).
- **Inv pan / Inv tilt** mirror the movement of a moving head that hangs the other way round.
- **Edit fixture** opens its definition in the fixture editor.
- ✕ removes the fixture from the patch.

Pixel strips and LED matrices

An LED strip, pixel bar or LED matrix is driven pixel by pixel as one picture that follows the show: the colours of the look that plays (or the palette you picked), the beat, the bass and the energy. FLASH, STROBE, BLACKOUT and the master work on it too. The pixels go out over Art-Net, sACN or a USB dongle like the other fixtures, so WLED, a pixel controller or an LED node reads them.

1. On the **Patch** tab, in **Pixel strips & LED matrices** at the bottom, press **+ Strip** or **+ Matrix**. Lumaestro picks a free universe.

2. Enter the number of **pixels wide** and the **rows** (1 for a strip), the **universe** and **address** the controller listens to and the **colour order** of the LEDs (WS2812 strips are usually GRB; RGBW for strips with a white LED).

3. For a matrix: **Zigzag wiring** when every other row runs back, **Starts at the other end** when the first pixel is on the right.

4. Choose the **effect**: *Auto* picks one that fits the look (calm: waves, peak: chases and sparkles), or a fixed one: Colour, Wave, Chase, Pulse, Sparkle, Rainbow, Level meter, Fire. **Brightness** and **Speed** are per strip.

5. Press **Save**. The bar above each strip shows the picture live.

- A pixel never straddles two universes: RGB uses 170 pixels per universe (510 channels), RGBW 128; the next pixels continue at channel 1 of the next universe, as pixel controllers and WLED expect. The line under each strip says which universes and channels it uses, and warns when a patched fixture uses the same channels.

- Up to 4,096 pixels per strip or matrix. The pixel strips are saved with the show.
- A strip has no row in the patch table, but its channels count as used: *next free* and the overlap warnings of the patch take it into account.

8 Fixture roles

Lumaestro chooses a role for every fixture from its channels. The role decides what the automatic show does with it.

ROLE	WHEN	WHAT THE SHOW DOES
Mover	Has pan and tilt (moving heads, scanners)	Movement, colour, intensity, gobo, prism and zoom.
Wash / colour	Has colour (RGB(W) LEDs or a colour wheel), no movement	Colour effects and intensity effects.
White (CW/WW)	Only white or warm/cold white emitters	Starts on a steady 3200 K at full, ignoring flash and strobe, and pinned so AUTO SHOW leaves it alone: a steady stage or front light. You can change this per group.
Dimmer	Only intensity channels	Intensity effects (off in calm looks).
Fog (manual)	Smoke machines and hazers	Only while **FOG** is held, with a 15 second safety limit.
Effect (never auto)	Lasers, spark machines, flame and confetti effects	Always 0. Use a custom button to fire them.
Not recognised	No channel Lumaestro understands	Nothing. Describe its channels in the fixture editor.
Missing	No definition found for this model	Nothing. Make one in the fixture editor.

Some channels are always kept at a fixed safe value: maintenance, reset and lamp channels stay at 0, built-in auto and sound programs are not started, and pan/tilt speed channels are set to fast.

9 Groups

Every Mover, Wash, White and Dimmer fixture belongs to exactly one group. New fixtures go into a group per fixture model automatically, for example all your "ERO Micro Spot" heads together. Groups are what you select on the Show tab to take control.

- **New group** on the Patch tab makes an empty group; give it a name.
- Change the group of a fixture in the **Group** column of the patch table. Choose **+ New group…** to create one on the spot.
- Rename a group by editing its name; delete it with ✕ (its fixtures go back to their default group).
- Fixtures inside a group are ordered by address. Effects such as chases and phase spreads run in that order.

> **Cannot put a fixture in a group?** Only fixtures with a usable role can be grouped. A fixture marked *not recognised* first needs its channels described in the fixture editor, or a different channel mode.

10 The Show tab

This is where you play. From top to bottom:

Tempo

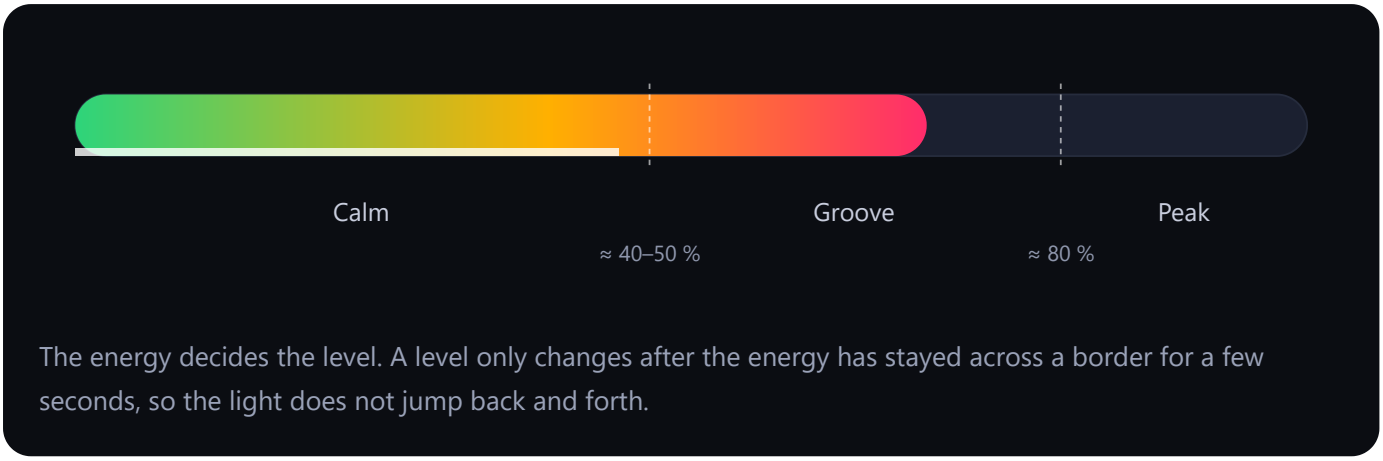
The large number is the tempo in **BPM**; the four bars blink on the beat, the first one (the downbeat) in white. With music input, Lumaestro finds the tempo itself. Tap **TAP** (or `Space`) four times or more on the beat to set it by hand; it then stays fixed. **Auto BPM** hands the tempo back to the music detection.

- **Auto BPM** is highlighted while the music detection sets the tempo; after TAP it is not, until you press it again.
- Tap on the beat you hear, at least four times. **The first tap is always beat 1** of the bar (the downbeat, the first of the four bars); the next taps count on 2, 3, 4. The tempo is taken from your last taps (up to eight), and every tap puts the beat exactly on your tap, so the effects line up with the music. Wait more than two seconds and the next tap starts a new count, again on beat 1. Tip: start tapping on the "one" of the music.
- **1st beat** (small button next to TAP, key `1`) makes the beat you hear now **beat 1** of the bar – also while the tempo follows the music (Auto BPM). Press it on the "one", for example where a chorus or a drop starts: look changes and four-beat effects then start on the one. While the music detection sets the beat, only the count is shifted (its timing stays); after tapping, beat 1 lands exactly on your press. The first of the four beat bars blinks white on beat 1.
- Everything on the beat follows the tempo: movement cycles, colour and intensity steps. Scene fade and hold times are in seconds and do not.
- Without audio Lumaestro starts at the *Start BPM* from Settings → Show & home.
- When the tempo comes from the DJ (Ableton Link or Pro DJ Link), a small ⇄ line under the BPM says from where, for example ⇄ *CDJ-3000*. The beat and beat 1 of the bar then come from the DJ too.
- A song of the setlist can set the tempo when it starts.

Energy

The coloured bar shows **how energetic the music is right now**, from 0 to 100%. It is calculated from the loudness of the music (60%) and how often a clear beat or kick is heard (40%). It reacts

slowly on purpose: one loud hit does not count, a few seconds of loud, busy music does. The thin white line underneath is the bass; it jumps on every kick.



The energy decides the level. A level only changes after the energy has stayed across a border for a few seconds, so the light does not jump back and forth.

The text next to **Energy** shows the current level: ● **Calm**, ● **Groove** or ● **Peak**. The buttons below choose who decides:

- **Follow music**: the level follows the energy bar.
- **Calm**, **Groove**, **Peak**: the level is fixed, whatever the music does. The level then shows "(fixed)".

Without working audio the bar stays empty: the show stays calm when the input hears nothing, or groove when there is no audio input at all. Fix the input under Settings or fix the level by hand.

Action buttons

Next to the energy meter (below it on a phone):

BUTTON	WHAT IT DOES
FLASH	While held: every group with FX on goes to full white. When you let go, the light fades back to the show in the **Flash fade-out** time below the buttons: 0.5, 1, 2 or 5 seconds.
STROBE	While held: groups with FX on strobe (with the fixture's own strobe, or simulated).
FOG	While held: fog machines run, for at most 15 seconds at a time.
BLACKOUT	Toggle: all light off, including custom buttons. It has no keyboard key on purpose, so it cannot be hit by accident.
FREEZE	Toggle: movement stops where it is; colours and intensity carry on.

MOVE	Toggle: when off, moving heads go to their home position and stay there.

Master

The large fader at the top sets the overall brightness of the whole show, 0–100 %. It works on top of the group levels: a group at 50 % with the master at 50 % plays at 25 %. FLASH still goes to full white. Custom buttons set their channels directly and are not dimmed by the master. The master can also be put on a MIDI fader (see Gamepad and MIDI).

AUTO SHOW and the current look

The large **AUTO SHOW** button in the top right corner is the autopilot. When it is on, **everything runs by itself**: looks change with the music and every group follows the automatic show. The group settings and the programmer are paused (a banner says so); the master, the action buttons, custom buttons, group levels and FX keep working. Turn it off to play by hand. Below it you see the look that is playing. See How the automatic show works.

Stage preview

A live drawing of the rig: moving heads at the top with their beams, white fixtures as soft cones, wash fixtures in the middle and dimmers and fog at the bottom. It shows the real colours and positions Lumaestro is sending. **Hide preview** folds it away during a show (remembered per device); **Show preview** brings it back. **Pop out ↗** opens the preview in its own window that fills the whole window, for example on a second screen; the preview on the Show tab is then folded away. If nothing opens, allow pop-ups for the Lumaestro page in your browser.

Edit layout places the fixtures in the preview the way they hang on your stage. Every fixture gets a white ring with two dots:

- **Inside the ring**: drag to move the fixture. Its beam moves along.
- **Blue dot**: where the beam points. For a moving head this is where it points at pan/tilt 50 %; the live movement then swings around that point.
- **Green dot**: the size of the fixture (and the width of its beam).

A moving head's beam follows its real angles, over the fixture's whole pan and tilt range (for example 540° pan and 270° tilt, from the fixture definition): tilt leans the beam away from straight down, pan turns that lean around. At pan and tilt 50 % the beam lands on the blue dot of the layout; leaning to the back the circle where the light lands moves up and gets smaller, to the

front it comes down and gets bigger, and a full pan turn takes the circle all the way round. Just like the real light, pan hardly moves the spot while the beam points straight down.

A bigger stage. Drag the bar under the preview down to make it higher (or up to make it lower); double-click the bar for the normal size. The height is kept per device. For the most room use **Pop out ↗**.

A fixture with several lamps in one unit (see Design) is drawn as one unit with every lamp in its own colour.

Several fixtures at once. `Shift`+click adds a fixture to the selection (or takes it out again); dragging a box on an empty spot selects every fixture inside it. Dragging one of the selected fixtures moves them all. The orange ↻ dot above the selection turns them around their middle, and each fixture turns along, so a row of bars can hang upright or at an angle; a single unit with several lamps can be turned on its own the same way. `Esc` clears the selection.

↶ **Undo** (or `Ctrl` + `Z`) takes back the last change while you edit the layout: a move, a turn, a size or beam change, or Auto layout. It works step by step, up to 50 steps.

Hover over a ring to see the fixture's name. **Save layout** stores the positions in the patch (and so in saved shows), **Cancel** throws the changes away and **Auto layout** puts every fixture back in the automatic rows (press Save to keep that). Editing also works in the pop-out window, which gives you more room. New fixtures start in the automatic rows until you place them.

Groups

One card per group with its name, the number of fixtures and a dot in the live colour of its first fixture. The tags show each layer: *auto* means the layer follows the show, a coloured tag means it has a manual setting. While AUTO SHOW runs, the card just says *AUTO SHOW*.

- **Click a card** to select or deselect the group for the programmer. **All** and **None** select every group or none.
- The **slider** on the card is the level of that group (a sub-master).
- **FX** decides whether the group reacts to **FLASH** and **STROBE**. White groups start with FX off so the front light stays steady.
- 📌 / 🔒 – one button with three steps; click it to go round:
  Off (grey 📌): the group follows everything – AUTO SHOW, presets, scenes, the programmer.
  📌 **Pin**: the group keeps its own settings while AUTO SHOW runs, and can be programmed while AUTO SHOW is on. Presets, scenes, FLASH and the master still work on it. CW/WW groups start pinned.

🔒 **Lock**: the group stays **exactly as it is, under all circumstances** – made for the front light. Presets (even when they contain something for this group), scenes, the programmer, AUTO SHOW and look changes, aim positions, FLASH, STROBE and the master all leave it alone; a layer on Auto keeps the look that was playing when you locked it. Only the group's own level slider still works, and BLACKOUT still switches it off (the emergency button). The card shows *LOCKED* and FX cannot be changed. Click 🔒 again to unlock.

Programmer

Gives the selected groups their own setting; see The programmer.

Auto show looks

All generated looks in three columns: Calm, Groove and Peak. Each shows its colour palette on the left and its ingredients (movement, effect, prism, gobo). Click a look to play it now; that also switches AUTO SHOW off so your choice stays.

Editing the looks and their colours

Press ✎ **Edit looks** above the looks. An orange bar with the **colours of the auto show** appears, and every look gets three small buttons:

- **Colours:** click a colour to switch it off (crossed out) or on again. The auto show then never uses it: every look keeps its movement and effects, but a colour that is off is replaced by the nearest colour that is on. Switch off red and orange, for example, and red becomes magenta and orange becomes yellow. The colour bars of the looks and palettes show the colours as they will play. Fixed colours and colour effects you give a group yourself are not changed. At least one colour stays on.
- ✎ **Edit** opens the look: name, energy level (Calm / Groove / Peak, the column it is in), colour palette, movement (pattern, how the fixtures and groups relate, cycle, size), colour and intensity effects for moving heads, washes and dimmers with their step, gobo, gobo spin, prism and zoom. The look plays while you edit and every change is kept right away; **Cancel** puts the look back as it was.
  Direction and phase spread: **Direction** sets which way the look runs: chases, waves and the phase movement go *Left → right* or *Right → left*. The generated looks are split exactly half and half per energy level, so the show doesn't keep sweeping the same way. **Phase spread** (with Fixtures *Phase* or *Mirror*) sets how far apart the moving heads are: from ¼ cycle (a gentle ripple) to 2 cycles (a tight wave). With Mirror the wave starts in the middle and runs outwards, or from the sides inwards when the direction is right to left. Every generated look gets its own

phase spread, so the patterns repeat less noticeably.
Own colours: under the palettes are the colours of the look. Click a colour to change it with the colour picker, + adds a colour (up to 8), ✕ removes one. From then on the look uses these own colours instead of the palette; ↺ **Palette colours** or clicking a palette goes back. A colour that is switched off for the auto show is crossed out, with the colour that plays instead after the arrow.

- ⧉ **Duplicate** makes a copy next to it ("… copy"), to make a variation without losing the original.
- ✕ **Delete** removes the look from the auto show.

From your first change the looks are your own list, saved in the show (together with the colour choice). **Generated looks** throws your changes away and goes back to the generated set; **Generate new looks** (Settings → Show & home) makes a new set and also replaces your edited looks. Press ✓ **Done** to hide the edit tools.

Size, speed and colours

CONTROL	WHAT IT DOES
Movement size	Makes every movement smaller or bigger (0–160%), for automatic looks and manual patterns alike. 0 % stops every head at its home position; handy in a small room.
Speed	Movement at ¼×, ½×, 1× or 2× the tempo. Colour and intensity effects stay on the beat. ½× is nice for slow songs at a high tempo.
Auto show colours	**From look** uses each look's own palette (or own colours); any other palette replaces it for every look until you choose From look again. The colours switched off under *Edit looks* still apply.

Buttons

Your custom buttons, for example a Sparkular or a blinder. **Edit** opens their settings.

11 How the automatic show works

Looks

A look combines a movement pattern with a spread, a colour palette and colour effect, an intensity effect for each kind of fixture and a beam setting (gobo, gobo spin, prism, zoom). Lumaestro generates 12 looks per energy level (you can change this under Settings) to suit your rig: gobos are only used when your fixtures have them.

Calm
Slow, smooth movement over 16–32 beats, soft fades and breathing, rainbow and duo colours, no prism.

Groove
Movement over 8–16 beats, colour changes on the beat, snakes and pulses, sometimes a prism.

Peak
Fast movement over 4–8 beats, chases, flicker and sparkle, scatter colours, prisms.

Settings → Generate new looks throws the dice again and makes a completely new set.

AUTO SHOW on

- Every group follows the look that is playing; manual group settings are paused (except pinned groups) and come back when you switch AUTO SHOW off. Both switches crossfade.
- Every 8 bars (Settings → *Change look every*) Lumaestro picks another look of the current level.
- When the level changes, it switches to a look of the new level after two bars.
- On a **drop** (the beat comes back hard after a quiet part) it jumps to a peak look straight away. Optionally a short strobe hit fires as well (Settings).
- Look changes crossfade (Settings → *Fade when auto changes look*).

AUTO SHOW off

Now you play. The current look keeps playing (it still moves, changes colour and pulses to the beat) but Lumaestro does not change to another look; you choose looks by clicking them. Each group uses its own settings from the programmer.

Automatic per layer

Every group has four layers (Move, Colour, Intensity, Beam). At the top of each layer in the programmer is the button **Automatic …** ("follows the look …"); below it are the choices by hand. A layer on Automatic follows the look that is playing; a layer with a choice by hand ignores the looks. In short: AUTO SHOW is the autopilot for everything; *Automatic* per layer decides whether that part of a group listens to the looks when you play by hand.

12 The programmer

1. Select one or more groups by clicking their cards.

2. Choose a layer tab: **Move**, **Colour**, **Intensity** or **Beam**, or ★ **Presets** to load a stored setting. Tabs that do not apply to the selection are hidden.

3. Choose the **Fade in** time (Snap to 8 seconds).

4. Press a button. The groups crossfade from what they were doing to the new setting. The **Automatic …** button at the top of the layer gives it back to the automatic show; while a layer is automatic, the choices below it are shown dimmed.

While **AUTO SHOW** is on the programmer is paused, except for pinned groups. In the Colour layer, the colour effects (Chase, Swap, Fade …) use the palette and step that sit right below them in the same box.

Changing an option (cycle, spread, size, palette, step, gobo …) re-applies the current setting with the new option.

Move

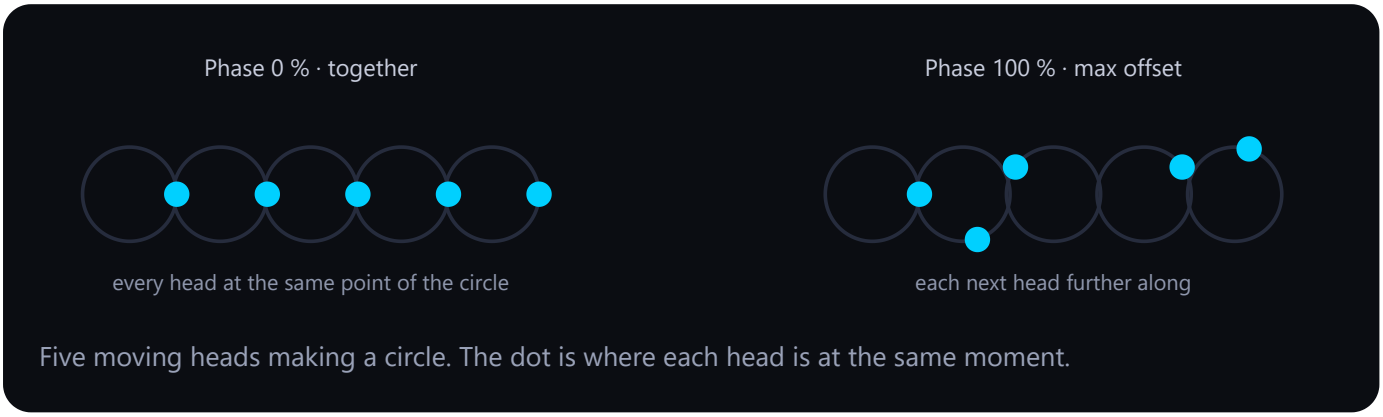
The Move layer is only shown when the selection contains moving heads or scanners. A pattern is drawn around the group's home position (or inside each fixture's movement range, see Movement range and home).

PATTERN	WHAT THE BEAMS DO
Home	Stand still at the home position (pan/tilt 50 % or the home you set).
Circle	A round circle.
Eight	A figure eight lying on its side: left-right with a double up-down.

Sweep	A wide left-right sweep with only a little up-down.
Wave	The heads stand in a fan from left to right and tilt up and down; with Phase this becomes a wave running through the row.
Fan	The heads open and close like a fan: from close together to spread wide and back.
Ballyhoo	A lively, irregular figure over the whole range – the classic "searchlight" party movement.
Cross	A diagonal line back and forth; with Mirror or Alt the beams cross each other.
Square	Along the four sides of a square, corner to corner.
Hits	Jumps to a new random position four times per cycle (with a 4-beat cycle: on every beat). All heads jump to the same point. For peak moments.
Still	The heads stand still in a fan from left to right.
Zigzag	Left to right in a zigzag line: four up-down steps per round.
Spiral	Three circles per round that grow from small to big and back.
Flower	A three-leaf flower (rose curve) through the centre.
Swing	Left-right like a pendulum, dipping at the ends.
Drift	Slow, calm wandering; every head drifts its own way. For calm moments.
V-Wave	The heads stand in a row and move up-down; the outer ones move most, so the row forms a V.

- **Cycle (beats)**: how many beats one round of the pattern takes: 1, 2, 4, 8, 16 or 32. 8 beats at 120 BPM is one round every 4 seconds. The speed control on the Show tab multiplies this.
- **Spread**: how the fixtures of the group relate:
  Sync – all make exactly the same movement at the same moment.
  Phase – each next fixture is a bit further along the pattern (a rolling movement).
  Mirror – the left half of the group moves mirrored to the right half (symmetrical stage pictures).
  Alt – every other fixture is mirrored (beams cross each other).
  Half – every other fixture runs half a round later.

- **Phase** slider: how far each next fixture runs ahead of the previous one. Fully left (*together*) all heads make exactly the same movement; fully right (*max offset*) they are spread evenly over one round of the pattern, so a circle becomes a rolling wave through the group. ⇄ makes each next fixture run behind instead of ahead. *Sync* sets the slider to the left, *Phase* to the right; with *Mirror*, *Alt* and *Half* the slider adds an offset on top of the symmetry.
- **Size**: how big the movement is, 10–150 %. 100 % is the pan/tilt range from Settings → Show & home, or the whole movement box of a fixture that has one.



Five moving heads making a circle. The dot is where each head is at the same moment.

Presets

The ★ **Presets** tab (left of Move) stores complete settings so you can call them back with one click.

- **Save:** set up a group the way you like (movement, colour, intensity, beam), select it, type a name, tick the layers you want to store and press **Save preset**. A layer that was on Auto is stored as Auto.
- **Load:** select one or more groups and click a preset. They crossfade to it with the **Fade in** time. Only the stored layers change; locked groups (🔒) are skipped. The preset that matches the selection is highlighted.
- ⟳ overwrites a preset with the current settings of the selected group; ✕ deletes it. Drag a preset by its ⠿ handle to change the order of the buttons.

Colour

The Colour layer has three parts. Pressing any of them gives the selected groups that colour setting.

- **Fixed colour**: Red, Orange, Amber, Yellow, Lime, Green, Cyan, Sky, Blue, Purple, Magenta, Pink and White, or any colour from the colour picker. RGB(W) fixtures mix it; fixtures with a colour wheel take the closest colour on the wheel.

- **White temperature**: 2700 K (warm, like a halogen lamp), 3200 K (stage tungsten), 4000 K, 5000 K, 5600 K (daylight) and 6500 K (cold). Fixtures with warm and cold white LEDs or a colour temperature channel mix it exactly; RGB fixtures approximate it.
- **Colour effect**: colours that change on the beat, using the **palette** and **step** (in beats: ½, 1, 2, 4, 8 or 16) right below the effects.

COLOUR EFFECT	WHAT IT DOES
Palette	All fixtures the same colour; every 16 beats the next colour of the palette.
Chase	Every fixture one palette colour further than the previous one, and every step everything moves one colour on: colours run through the group.
Swap	All fixtures the same colour, changing to the next palette colour every step.
Fade	Smooth, continuous crossfades through the palette colours (a longer step is slower); every next fixture is a little ahead, so the colours flow through the group.
Split	Odd and even fixtures in the first two palette colours, swapping every 16 beats.
Rainbow	All colours of the rainbow, spread over the group and slowly turning (one full rainbow every 8 steps). Ignores the palette.
Duo	Odd and even fixtures in two colours that swap every step; after four steps the next pair of colours.
Scatter	Every fixture a random colour from the palette, new every step. Busy, for peaks.

Palettes: Fire (red, orange, amber), Ocean (blue, sky, aqua), Neon (pink, cyan, violet), Sunset (orange, pink, purple), Ice (white, light blue, blue), Forest (green, lime, yellow), Royal (indigo, purple, white), Candy (pink, light blue, white), Heat (red, white, red-orange), Party (red, yellow, green, blue, purple), Toxic (lime, mint, yellow-green) and Miami (cyan, pink, white).

Intensity

Intensity effects decide how bright each fixture is, in time with the beat. **Rate (beats)** sets the speed: ¼, ½, 1, 2 or 4 beats per step (smaller is faster).

EFFECT	WHAT IT DOES

Full	Always at full.
Off	Always dark (the fixture keeps its colour and position, ready for the next setting).
Pulse	A hit on every step that fades back to about a third: the light breathes with the beat.
Chase	One fixture at a time at full, running through the group; the previous one glows a little.
Bounce	Like Chase, but back and forth: left to right and back again.
Alternate	Odd and even fixtures take turns.
Sparkle	Every step about half of the fixtures, chosen at random, are at full.
Wave	A soft brightness wave rolling through the group (one wave every four steps).
Breathe	Slowly brighter and softer (between 20 % and full, one breath every four steps), shifted a little from fixture to fixture.
Bass	Follows the bass of the music live: brighter on every kick. Without audio it follows the beat clock.
Snake	A chase with a tail: one at full, the two behind it fading out.
Build up	Rises from dark to full over four steps, then drops and starts again – for build-ups before a drop.
Flicker	Fast, random flickering of a few fixtures at a time.
Left / right	The left half and the right half of the group take turns.

Beam

Only for moving heads. Fixtures without a gobo wheel, prism or zoom simply ignore that part.

- **Open** – no gobo, no prism: a clean beam. **Gobo** – a gobo pattern; **Prism** – the prism splits the beam; **Gobo + Prism** – both.
- **Gobo** number: which gobo on the wheel (the choices go up to the number of gobos of your fixture with the most gobos).
- **Gobo spin**: lets a rotating gobo turn (only on fixtures with gobo rotation).

- **Zoom**: 0 % is the narrowest beam, 100 % the widest (only on fixtures with a zoom channel).

13 Scenes

A preset belongs to one group. A **scene** is the whole stage at one moment: which groups are on and how bright, their colours, effects, movement and beam, single lamps with their own colour or level, and where every moving head points. Make a list of scenes for a song, a play, a speech or a whole evening and go through it with **Next** or let it play on time. You play scenes on the Show tab and build them on their own page, **Scenes**. That makes Lumaestro just as useful in a theatre as in a bar, club or on a stage.

The Scenes page

Open the **Scenes** tab at the top to make and change scenes. Building scenes and running a show do not mix, so:

- Lumaestro first **warns you**: while you edit, the live show stops. AUTO SHOW and Play on time switch off and the stage shows the scene you are building, so you see every change on the real lights. An orange bar shows that you are editing.
- On the left is the list of scenes, in playing order. Click one to edit it; it is shown on stage right away. Drag the ⠿ handle to change the order.
- The stage preview moves along to the top of this page.
- Every change is **saved by itself** (the word *Saved* above the groups tells you it is done).
- Press ✓ **Done, back to the show** (or another tab) when you are ready: AUTO SHOW comes back if it was on before.
- **Other devices go along.** As soon as one browser edits scenes, every other phone, tablet or computer with the control page open switches to the Scenes page too and shows the same scene, so nobody operates a show that is not running. When editing is done, they all go back to the Show tab. A device that only has the operate password (see Passwords) can watch but not change anything.

Building a scene

- + **New scene** starts **dark**: every group off, white, steady, moving heads at their home position. Turn on what you need, from the ground up. **From the live stage** makes a new scene from what was on stage just before you opened the page (for example a moment of the auto show you liked).

- **Name and description:** the few words you type under *What is it* are shown on the scene's button on the Show tab, e.g. *warm front, spots on the singer*. Without a description the button lists the groups that are on.
- **Fade** is the crossfade into the scene, **Hold** how long it stays when it plays on time (both in seconds).
- **Per group** (one card each): **On/Off** and the level slider; a **colour** (a fixed colour, any colour with the colour picker, a white temperature, or a colour effect with palette and step); **intensity** (steady or an effect such as pulse or chase); and for moving heads the **movement** (standing still at the aimed position, or a pattern), the **beam** (open, gobo, prism, zoom) and the **position**. Every layer can also be set to *Auto*: then it follows the auto look.
- **Position:** the large amber square *all together* aims all moving heads of the group at one spot (blue dots show where each one points); the blue squares, one per moving head, aim each one on its own. All squares are the same large size, in rows under each other. **Clear** removes the aim, so the heads use the movement setting again.
- **Per lamp** (fold it open on the card): give a single lamp its **own colour**, or its own **level** (as a part of the group level), for example one blue spot in a warm front light.
- **All off** switches every group off, **Duplicate** makes a copy just after it (handy for a variation), **Delete** removes the scene.

Using scenes

- On the Show tab every scene has a button, made like the auto look buttons: on the left the **colours** of the scene, then its number, name and description. The scene on stage is highlighted.
- **Go to a scene:** click its button. The stage crossfades into the scene over its Fade time and AUTO SHOW switches off so the scene stays as it is.
- **Next ▶** and **◀ Back** step through the list. Next with no scene on stage starts at the first one. `Page Down` / `Page Up` do the same, so a presentation clicker works as a remote (unless you set them to the setlist, see below).
- **▶ Play on time** goes through the list by itself: each scene fades in and stays for its Hold time before the next one starts. A bar under the button shows how long it still has, and the line above says what comes next. **Loop** starts again at the first scene after the last one; without Loop, playback stops at the end. **■ Stop** keeps the current scene on stage.
- **Back to the auto show:** switch AUTO SHOW on. Everything follows the automatic show again, **including the moving heads** that the scene aimed; there is no need to press *Back to the show* first. A position you set yourself on the Aim pad stays.

The master, the action buttons (FLASH, STROBE, BLACKOUT…) and custom buttons are not part of a scene and keep working on top of it. A group that was made after the scene was saved, or a locked group (🔒), keeps doing what it does. Scenes are saved in shows, and every scene can be put on a MIDI pad or gamepad button.

14 Setlist

For a band, a theatre show or any evening with a fixed order: the **setlist** is the list of songs. Every song says how the light starts, and on the Show page you go through the list with **Next ▶**, a MIDI pad or a presentation clicker.

The Setlist page

Open the **Setlist** tab (or ✎ **Edit setlist** in the Setlist block). **+ Song** adds a song; drag ⠿ to change the order. Click a song to change it:

FIELD	MEANING
Song, Artist	The name, shown in the list and big while it plays.
BPM	The tempo of the song: when the song starts the tempo is set and stays fixed (like TAP). Empty: the music (or the DJ) decides the tempo.
Start with	**AUTO SHOW** (the automatic show), a **Scene**, a fixed **Look** or **Blackout**.
Colours, Speed, Movement size	For AUTO SHOW and a look: the palette (or the look's own colours), the speed and the size of the movement. A scene brings its own.
Energy	Follow the music, or keep it at Calm, Groove or Peak for this song.
Notes	Shown big in the Setlist block while the song plays, for example "strobe on the last chorus".

▶ Start now starts the song right away to try it. Changes are saved by themselves. The setlist is saved with the show, so every gig can have its own.

Excel: import and export

Make or change the setlist in Excel (or Google Sheets, Numbers …) and read it in, or hand the setlist to the band as a spreadsheet.

- **⬇ Export to Excel** saves the setlist as an Excel file (`Setlist <show>.xlsx`). With an empty setlist you get a template with only the column names.

- **⬆ Import Excel / CSV…** reads an Excel file (`.xlsx`) or a CSV file (comma or semicolon). When there are songs already, Lumaestro asks whether to **replace the setlist** or **add the songs at the end**.
- One song per row. The first row names the columns, in any order: *Song, Artist, BPM, Start with, Scene or look, Colours, Energy, Speed, Movement size %, Fade (s), Notes*. Only **Song** is needed; Dutch column names (Titel, Artiest, Tempo, Kleuren, Energie, Opmerkingen …) work too. A list with only song names in the first column also works.
- **Start with**: AUTO SHOW, Scene, Look or Blackout. **Scene or look**: its name as in Lumaestro (a name without "Start with" is enough). **Colours**: a palette name such as Fire or Ocean (empty: the look's own colours). **Energy**: Follow music, Calm, Groove or Peak. **Speed**: 0.25, 0.5, 1, 2 (or ½×, 2× …). **Movement size %**: 100 is normal. **Fade (s)**: seconds into this song (empty: the setlist's crossfade).
- After the import Lumaestro lists what it could not use, for example a scene name it does not know (that song then starts with AUTO SHOW).
- Old `.xls` files cannot be read: save them in Excel as *Excel workbook (.xlsx)* first.

Playing the setlist

- The **Setlist** block on the Show page shows the song that plays (number, name, its settings and the notes) and the next song. **Next ▶** starts the next song, **◀ Back** the previous one; click any song to jump to it.
- **Crossfade:** the lights flow from one song into the next: look, colours, movement size, a scene and a blackout all fade together. Set the time at **Crossfade between songs** on the Setlist page (2 seconds by default, 0 is a hard cut). A song can have its own time at **Fade into this song**; a song that starts a scene uses this time instead of the scene's own fade.
- **Page Down / Page Up and a presentation clicker** go through the scenes by default. Under **Settings → Show & home** choose *the setlist* to step through the songs with them instead.
- Under Settings → Gamepad & MIDI the actions *Next song*, *Previous song* and every single song can be put on a pad, a pedal or a clicker.
- During a song you can still do everything: FLASH, STROBE, scenes, groups. The next song starts fresh with its own settings.
- The block is hidden when the setlist is empty.

15 Aim: solo spots

For a solo you want the moving heads on one person, fast: all of them on the guitarist, or on the drum kit. The **Aim** panel is on the Show tab under Scenes (only when there are moving heads or scanners); click its title to fold it open or away. It has a square that works like an XY cursor.

- **The big square** (*All together*) points every moving head and scanner in the selected groups at the same spot (with no group selected: all of them). Left/right is pan, up/down is tilt. Small orange dots show where each one points.
- **A small square per moving head** (under the big one, named after the fixture) aims that one on its own: for example three on the guitarist and two on the drum kit. Start with the big square and fine-tune with the small ones. The aim works on top of the fixture's own movement; the colours and the rest go on.
- **In a scene:** scenes have their own position squares on the Scenes page (see Building a scene). Their aim comes back with the scene and is let go again when AUTO SHOW comes back.
- The square covers each fixture's **movement range** (Movement range and home). Set the ranges of all moving heads to the same stage area and the beams come together on the same spot; without a range the square covers about 90° pan and 60° tilt around the group's home position. Use *Invert pan / tilt* in the patch when a fixture goes the wrong way.
- **Full light** (on by default) puts the aimed moving heads at full intensity, so a chase in the show does not darken the solo spot. The master, the group level and BLACKOUT still apply.
- **Back to the show** lets the moving heads fade back to what the show does.
- **Positions:** aim, type a name and press **Save position**. A position remembers where every aimed moving head points, and Full light. Click it to call it up (with its **Fade** time); click it again to go back to the show. ⟳ overwrites it with the current aim, ✎ renames, ✕ deletes, and the ⠿ handle drags it to another place in the list. Positions are saved in shows.
- Positions work during the show, also while AUTO SHOW runs: every position can be put on a **MIDI pad or gamepad button**, and *Aim left/right* and *Aim up/down* on two MIDI faders or knobs to steer by hand (see Gamepad and MIDI). The faders steer the groups you aimed last.

16 Custom buttons

A custom button sets chosen DMX channels of chosen fixtures to fixed values while it is on. Use it for effects the automatic show must never touch, such as a **Sparkular** (cold spark machine), a blinder, a confetti cannon or a mirror ball motor.

Making a button

1. Go to **Settings** → **Custom buttons** (or press **Edit** next to the buttons on the Show tab) and press **Add button**. Every button is one short line there (colour, name, type, fixtures); **Edit** unfolds its settings and **▲ Close** folds them up again. A new button opens right away.

2. Give it a **name** and a **colour**.

3. Choose the type: **Flash (hold)** is on only while you hold it; **On / Off** toggles with each press.

4. Set a **safety limit** in seconds: the button switches off by itself after that time (0 = no limit). For spark and fog effects, always use one.

5. Optionally choose a **key** to trigger the button from the keyboard.

6. Choose a **fixture**. Every DMX channel of that fixture is listed with a menu of what it can do, taken from the fixture definition (for example *Pre-Heat ON (240–255)* or *Height 5 (112–135)*). Pick a function and Lumaestro fills in a value in the middle of its range, or choose *Exact value…* and type 0–255. *Leave to the show* keeps the channel as the show sets it. **All 255** fills every channel, **Clear** empties them.

7. Have several of the same fixture? **Apply to all … ×** adds every patched fixture of that model and mode with the same settings, so one button controls them all. Use

+ **Fixture** to add other fixtures as well.

8 Press **Save buttons**.

> **Example: Sparkulars.** The Sparkular is in the fixture library. Make two buttons:
> • **Pre-heat**: type *On / Off*, no safety limit. Choose one Sparkular, set *Control* → *Pre-Heat ON*, leave *Fountain* to the show, then press **Apply to all**. Switch it on a few minutes before you need the sparks.
> • **Sparks**: type *Flash*, safety limit 5–10 seconds. Set *Control* → *Pre-Heat ON* and *Fountain* → *Height* (choose the height), then **Apply to all**. The sparks only fire while you hold the button. The show itself always keeps spark machines at 0.

Rules

- **BLACKOUT always wins**: while it is on, buttons have no effect.
- A Flash button is released automatically when the phone or browser that holds it disconnects.
- When several active buttons set the same channel, the lower one in the list wins.
- Drag a button by its ⠿ handle (Settings → Custom buttons) to change the order: that is also the order of the buttons on the Show tab. Press **Save buttons** afterwards.

17 Gamepad and MIDI

A gamepad (Xbox, PlayStation or any USB/Bluetooth game controller) or a MIDI controller (pads, keys, buttons, faders) can call scenes, fire custom buttons and play the show actions, so you don't need to look at a screen. Set it up under **Settings → Gamepad & MIDI**.

First choose where the controller is plugged in, under **Controller is plugged into**:

The Lumaestro PC

The controller is plugged into the PC where Lumaestro.exe runs. Lumaestro reads it itself: no browser window is needed, and it keeps working when the page is closed or minimised. The best choice for a fixed setup. Xbox-style gamepads (XInput) work best and use the same button numbers as in the browser; other USB gamepads are used when no Xbox pad is connected. New devices are found within two seconds.

This browser / device

The browser that shows the control page reads the controller, for example a gamepad on a laptop that controls Lumaestro over the network. Gamepads then only work while that page is visible.

The bindings are the same list in both cases. After switching, check the gamepad buttons once: other gamepads than Xbox pads can number their buttons differently. A MIDI device can only be used by one program at a time; if the status line says it is in use, close the other program (or the browser tab that had it).

1. Plug in the controller on the PC you chose. A gamepad shows up after you press one of its buttons. For MIDI, press **Connect MIDI** once and allow MIDI devices when the browser asks; after that it connects by itself.
2. Press **Learn** next to an action, then press the button, pad or key you want for it. The input appears next to the action. `Esc` or **Cancel** stops learning, ✕ removes a binding.
3. That's it: the controller now works on the Show tab and everywhere else on the page. The line above the list shows the last input that came in, which helps to find out what a button sends.

ACTION	WHAT THE CONTROLLER DOES

Next scene, Previous scene, Play on time / Stop	The same as the buttons in the Scenes panel.
Go to a scene	One per scene: jumps straight to it (with its fade).
Custom buttons	Flash buttons work while you hold the controller button, On/Off buttons switch on each press.
TAP tempo, 1st beat	The same as TAP and 1st beat on the Show tab: tap the tempo on a pad, or set beat 1 from a button.
FLASH, STROBE, FOG	While held, just like on the screen (FOG keeps its 15 s safety limit).
BLACKOUT, FREEZE, AUTO SHOW	Switch on or off with each press.
Aim positions, Back to the show	One per stored position: on, and back to the show on the next press (see Aim).
Aim left / right, Aim up / down	Learn them with two MIDI faders or knobs to steer the solo spot by hand.
Master	Learn it with a MIDI fader or knob (CC), or the analog trigger of a gamepad.
Group levels	One per group: a MIDI fader or knob moves the level fader of that group.

Button lights

Lumaestro recognises many MIDI controllers by their name and lights the pads and buttons you have bound: **dim** = bound, **bright** = on. Scenes and Play are green (the scene on stage is bright), custom buttons, FOG, STROBE and BLACKOUT are red, FLASH is white, aim positions and FREEZE are blue, Next/Back and AUTO SHOW are yellow. Controllers with only one colour light up only for "on".

Under **Button lights** (above the list of actions) every connected MIDI controller is listed with what was recognised:

- Recognised: Novation Launchpad (Mini MK3, X, Pro MK3 – switched to programmer mode automatically –, MK2, Pro, S, Mini), Novation Launch Control (XL), Akai APC mini and APC mini

mk2, APC Key 25, MIDImix and Korg nanoKONTROL2 (set *LED Mode: External* in the Korg Kontrol Editor).

- Not recognised (for example because Windows gives it another name): choose the type in the menu. **Generic** sends note / CC value 127 for on and 0 for off, which works on many other controllers.
- Unknown devices stay dark on purpose: sending notes to a synthesizer would play them. **No lights** switches it off for one device.
- A binding remembers which MIDI device it was learned on, so two controllers that send the same note each light only their own pad.
- In the browser, the Launchpads that need programmer mode ask once for permission to "control and reprogram MIDI devices" (SysEx). On the Lumaestro PC no permission is needed.

- **What counts as a button:** gamepad buttons, the directions of the sticks and d-pad, MIDI notes (pads, keys), MIDI CC buttons (pressed above half) and MIDI program changes. One input does one thing: learning it for a new action removes it from the old one.
- **In the browser**, gamepads only work while the Lumaestro page is visible (that is how browsers handle them); **MIDI** also works when the window is in the background. Use Chrome or Edge. On the Lumaestro PC there is no such limit.
- **One page per PC** (browser setting only): if the Lumaestro page is open twice on the same PC, only the first one reacts to the controllers, so Next never skips two scenes. The pop-out preview never reacts. **Use controllers on this device** switches it off for that browser.
- Held actions (FLASH, STROBE, FOG, Flash buttons) are released when the gamepad is unplugged or the page is hidden.
- The bindings are stored with the show, because they point to its scenes and buttons. Where the controller is plugged in is a setting of the PC and stays when you load another show.
- **Motor faders (Behringer X-Touch and other Mackie Control surfaces):** in Mackie Control mode the faders send *pitch bend*. Lumaestro reads that as a fader ("MIDI fader (pitch bend, ch 1)"), so you can learn them for Master, group levels and Aim.

Mixing desks and OSC

A digital mixing desk can be a controller too, over the network. The idea: the sound engineer taps the tempo for the delay effect on the desk anyway. Learn that key for **TAP** and the tempo is tapped once, on the desk, and the light follows. Any other key or fader on the desk can be learned the same way (scenes, BLACKOUT, Master, …).

Open **Mixing desks & OSC** on **Settings** → **Gamepad & MIDI**, switch on your desk and fill in its IP address, or press 🔍 **Find** to let Lumaestro look for it on the network. The status line above

shows *connected* once Lumaestro reaches it. Then press **Learn** next to an action and press the key on the desk; the input shows up as, for example, “SQ: MIDI note G3 (ch 8)” or “X32: OSC /fx/2/par/02”. Lumaestro reads the desks itself, also when the gamepad and MIDI controllers are read by the browser. The PC with Lumaestro must be on the same network as the desk.

DESK	HOW IT CONNECTS	WHAT TO LEARN
Allen & Heath SQ (SQ-5, SQ-6, SQ-7)	MIDI over the network (TCP port 51325). Lumaestro connects to the desk and keeps trying when it is switched on later.	SoftKeys send a MIDI note when pressed (the default tap tempo is SoftKey 8). Fader and mute moves (NRPN) are ignored while learning, so only the key you press is learned.
Behringer X32 / M32	OSC (UDP port 10023). Lumaestro subscribes to the changes of the desk (*/xremote*).	Every change on the desk: user-assignable buttons, faders, mutes and effect parameters. For the FX tap: tap the delay twice on the desk while Learn is waiting; the delay time that changes becomes the TAP input.
Behringer X-Air / XR12, XR16, XR18, Midas MR	OSC (UDP port 10024), the same way.	As the X32.
DiGiCo, TouchOSC, QLab and other OSC senders	**OSC in**: Lumaestro listens on a UDP port (8000 by default). Send OSC to the IP address of the Lumaestro PC on that port.	Any OSC message. On a DiGiCo, make a macro that does the FX tap and also sends an OSC message to Lumaestro.

- **How OSC is read:** a value bound to a fader action moves it (0–1). Otherwise a message is a button: a number 0 lets go, any other number or a message without a value presses. A value between 0 and 1 that is not bound to a fader (such as a delay time) presses on every change.
- **Tapping on the desk:** Lumaestro takes the time a message arrives, so the tempo is as exact as tapping on the screen. A desk that only reports a *changed* delay time may skip a tap when you tap the same tempo again; keep tapping and it picks up.
- **Desk on DHCP:** a desk that gets its address from a router (DHCP) may get another one next time. With *Find the desk again by itself when its address changes* switched on (it is by default), Lumaestro looks for the desk on the network as soon as it no longer answers at its old

address, connects to it at the new one and remembers that address. An SQ is recognised by its MIDI network port (TCP 51325), a Behringer desk answers a question to the whole network (*/xinfo*). The search covers the local network of the Lumaestro PC (the usual 254 addresses) and takes about a second. With two desks of the same kind on the network, Lumaestro does not guess: 🔍 **Find** lets you pick one. For a show that must never be surprised, give the desk a fixed address (in the desk's network settings, or a DHCP reservation in the router).

- Yamaha desks and other desks with a MIDI output: connect them with a MIDI interface (USB) and learn them as a normal MIDI controller. Network MIDI (rtpMIDI) shows up in Windows as a normal MIDI port and works the same way.

18 Movement range and home

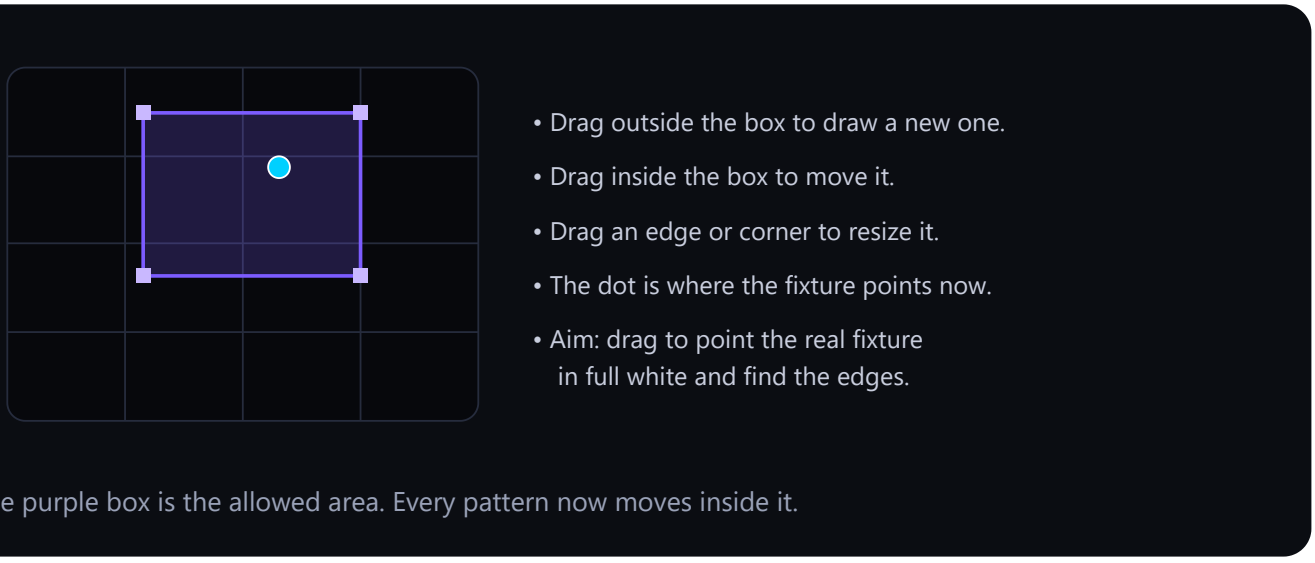
Before a show, decide where your moving heads and scanners may point. There are two settings.

Home position per group

Settings → **Mover home positions**: pan and tilt sliders per group set where the heads point when centred. Movements are drawn around this point, and the *Home* pattern and MOVE off go there. Switch MOVE off on the Show tab to see the home position.

Movement range per fixture

Settings → **Movement range per moving head / scanner** shows a square per fixture: left to right is pan, top to bottom is tilt, each over the fixture's full range.



The purple box is the allowed area. Every pattern now moves inside it.

1. Switch **Aim** on for a fixture and drag in its square. The real fixture follows in full white, so you can see on stage where it points.

2. Find the edges you want (for example: not lower than the stage edge, not past the side walls), then switch Aim off.

3. Draw or drag the box to those edges, or type the percentages below the square. It is

saved when you let go.

Once a fixture has its own box, patterns are scaled to fill that box and the group home position becomes a point inside it (50% = the centre of the box). **Full range** removes the limit. Aiming stops automatically when you leave the Settings tab.

19 The fixture editor

The **Fixture editor** tab creates and changes fixture definitions in the open **Open Fixture Library** format (JSON). Use it when a fixture is *missing* or *not recognised*, when a library definition is wrong, or to add pan/tilt degrees or colour wheel values.

Opening a definition

- Search on the left and click a fixture, or press **Edit fixture** in the patch table (the mode you use is then highlighted).
- **New fixture** starts an empty one. For a missing fixture, the editor starts a new definition with the patched manufacturer, model and mode.

General

Manufacturer, model, type (Moving Head, Scanner, Color Changer, LED Bar, Dimmer, Effect, Smoke ...) and the **pan and tilt range in degrees**. The degrees matter for moving heads: Lumaestro uses them to make movements the same size on different fixtures.

Channels

Every channel has a **name** and a **function**. The function tells Lumaestro what the channel does; it is saved as the matching Open Fixture Library capability type:

FUNCTION	USE FOR
Pan, Tilt (+ fine)	Movement. Fine channels add 16-bit precision.
Pan/tilt speed	Movement speed; Lumaestro keeps it on fast.
Dimmer (+ fine)	Master intensity.
Red, Green, Blue, White, Amber, UV, Lime, Cyan, Magenta, Yellow	Colour LEDs. Lumaestro mixes any colour from them.
Warm white, Cold white	Tunable white LEDs (the name must contain "warm"/"WW" or "cold"/"CW"; the editor does this for you).

Colour temperature	A single CCT channel.
Shutter / strobe	A shutter with ranges (open, closed, strobe slow→fast).
Strobe (slow → fast)	A simple strobe channel without ranges.
Colour wheel, Colour macro	A wheel or macro channel: needs ranges with colours.
Gobo wheel, Gobo rotation	Gobos: the wheel needs ranges (Open, Gobo 1, Gobo 2 …).
Prism, Prism rotation	Prism in/out and rotation.
Zoom, Focus, Frost	Beam shaping.
Effect speed, Effect / program / sound	Built-in programs; kept at 0 (or their default value).
Reset / maintenance	Always kept at 0.
No function	Unused channel.

A channel whose function does not match the list keeps its original setting from the file ("As in file"). Drag a channel by its ⠿ handle to put it somewhere else (or use ▲▼ to move it one place), ✕ to delete one (it is removed from every mode too), and **Default** for a channel that must sit at a fixed value.

Invert: channels that work the other way round

Some fixtures work a channel the other way round: the dimmer is **off at 255** and full at 0, or pan starts at the other side. The **Invert** column has a button for every channel that runs over the whole range (pan, tilt, dimmer, colour LEDs, colour temperature, zoom, focus, frost, fog, speed). **0→255** is normal; click it to make it ⇅ **255→0**, then save. Lumaestro then sends that channel turned around, fine channels included, and the show, Aim, scenes and presets just work. A channel with value ranges has no Invert button: there you enter the ranges the way the manual gives them.

Invert belongs to the definition, so it counts for every fixture of that model. Are only some of your lamps of the same model inverted (for example an older batch)? Save a copy of the definition under another model name (e.g. … *(inverted dimmer)*), switch Invert on there, and use that one for those lamps in the patch. Only pan or tilt reversed because of how a moving head

hangs? Use *Inv pan* / *Inv tilt* in the patch table instead. In the file, an inverted channel is stored the Open Fixture Library way (e.g. brightness 100% → 0%), so it stays a valid file that other programs read correctly too.

Value ranges

Wheels, macros, gobos and shutters do different things at different values. Press **add ranges** on the channel and enter each range from the fixture's manual: **From**, **To**, **What it does**, and for colours tick the box and pick the **colour**. Lumaestro chooses the closest colour on the wheel for the colour the show wants. **Split 0-255 evenly…** creates a number of equal ranges at once, which you can then rename.

Words in the description are understood: "Open", "Closed", "Strobe slow→fast", "Gobo 3", "Red", "Rotation" and so on. Ranges for rotation, rainbow, sound or random effects are skipped by the show.

Part of a channel. When only part of a dimmer, colour, pan or tilt channel does that job (for example pan on 0-127 and nothing on 128-255), give the channel ranges: Lumaestro then stays inside the part with the dimmer, colour, pan or tilt function and never sends the rest. Also fill in the **Pan range** and **Tilt range** in degrees at the top (for example 180), so movement sizes and the preview match the real fixture.

Modes

A mode is the list of channels in DMX order, exactly as the fixture expects in that channel mode (for example "7 channel"). Add channels with **+ add channel…**, reorder them by dragging their ⠿ handle (or with ▲▼), remove them with ×, copy or delete the whole mode, and rename it. Each channel shows what Lumaestro makes of it: green means it will be used, orange that it is ignored.

What Lumaestro sees

Below each mode, the editor shows live which role Lumaestro will give the fixture in that mode and which features it found. When it says *Unused*, the show cannot use that mode yet: add ranges to the colour or macro channels, or choose a mode with RGB channels.

> **Example.** The Ayra IntenZ CB-150 LED bar in "5 channel" mode has five colour-macro channels, but the definition that was available for it did not list their values. Lumaestro marks it *not recognised* and it cannot be grouped. Either set the bar to its 15 channel mode

> (RGB per section, fully supported), or open it in the editor, add the colour ranges from the manual to the five macro channels and save.

Design: several lamps in one unit

Many fixtures are more than one lamp: an LED bar with five sections, a fixture with two moving heads on one base, a wash with separate segments. The **Design** panel at the bottom of the editor says how the fixture looks and how many lamps one unit has. Every lamp then counts as a fixture of its own in the show: a chase runs along the five sections of a bar, a wave rolls through them, and two heads on one base move on their own.

- **Found by itself.** Lumaestro reads the channel names: "Red 1 … Blue 5", "Tilt 2", "Head 3 Dimmer" or "The 2nd head Color" belong to lamp 1, 2, 3 …; three times Red, Green and Blue without numbers counts as three lamps. Channels without a number (Dimmer, Strobe, a colour macro for the whole unit) are shared: Lumaestro keeps the shared dimmer open while any lamp is lit and lets every lamp make its own level and colour. Below each mode the editor says *5 lamps in one unit* when it found them.
- **Lamps in one unit** chooses how many lamps Lumaestro uses: from 1 (the whole unit acts as one lamp) up to the number it found. With fewer lamps, neighbouring sections act together, for example 6 sections as 3 lamps of 2.
- **Layout**: a row, a column, a grid (with lamps per row), two sides (a gap in the middle, like two heads on one base) or Free: drag every lamp to where it sits on the fixture.
- **Body** (bar, box, base or none), **Head** (round, square or a bar), **Lenses that act as one** (a head with three lenses that always have the same colour) and **Movement of a head** (fixed, tilt, pan + tilt) only change the drawing; what a lamp can do comes from its channels.
- Without a design, a fixture with numbered colour channels is split by itself, unless it has one pan / tilt for the whole unit: a moving head with LED rings stays one lamp until you draw it.

The design is saved with **Save fixture** as an **Open Fixture Design**: a small file next to the fixture definition with the same name, for example `intenz-cb-150.ofd.json` next to `intenz-cb-150.json`. The definition itself stays a plain Open Fixture Library file. The design travels along when you export your fixtures or save a show, and the Art-Net Viewer uses it too. Designs are also shared through the Lumaestro library on qmix.nl: **Update fixture library** adds the designs of library fixtures that have none yet (your own designs are never replaced). **Remove design** deletes it, and Lumaestro guesses again.

> **Example.** The CB-150 in "15 channel" or "18 channel" mode: Lumaestro finds five lamps (Red 1 … Blue 5). In the preview the bar shows five lamps in a row, each in its own colour,

> and the auto show runs its chases along them.

Saving

Save fixture writes the definition as an Open Fixture Library JSON file into `fixtures\mine\<manufacturer>\<model>.json` next to Lumaestro.exe. Your own definitions take priority over the library. Channels you did not change are saved exactly as they were, so wheels, matrix pixels and other details of a library definition are kept. Patched fixtures of that model use the new definition immediately. The editor warns about missing names, duplicate channel names, empty modes and reversed ranges before it saves.

My fixtures: export and import

Under the search field, **My fixtures** lists every definition you made or changed. Click one to open it in the editor.

- ⬇ next to a fixture saves it as a single file, `Manufacturer - Model.json`, for example to send it to someone or keep a copy.
- ⬇ **Export all (.zip)** saves all your fixtures in one zip file (Open Fixture Library layout).
- ⬆ **Import…** reads one or more `.json` files or a zip made by Export all. Fixtures you already have are only replaced after you confirm. Plain Open Fixture Library files (for example downloaded from open-fixture-library.org) work too; Lumaestro then asks for the manufacturer.
- ✕ deletes one of your definitions; if the library has the same model, its version is used again.

> **Moving to another PC.** On the old PC press **Export all (.zip)** and, under Settings → Shows, **Export** your shows. On the new PC start Lumaestro.exe, import the zip in the fixture editor and import the show files. A show also carries the fixtures it uses, so for a single show the show file alone is enough.

20 Saving and loading shows

A **show** stores everything you set up for an event in one file, so you can keep several shows (for example per venue or per band) and switch between them.

In a show

The patch with movement ranges, groups with their manual settings and home positions, custom buttons, presets, scenes, the setlist, the live page layouts, pixel strips, gamepad/MIDI bindings, show, Art-Net and sACN settings, and the live controls (master, speed, size, colours, energy, AUTO SHOW, flash fade-out).

Travels along

Your own fixture definitions used in the patch are stored inside the show, so an exported show also works on another PC.

Not in a show

The audio input and the web server port: those belong to the PC.

Open **Settings** → **Shows**, or click the **Show:** label at the top right of the page, which always shows the current show.

- **Save:** type a name and press **Save show**. **Save over** next to a show overwrites it with the current state.
- **Load:** press **Load** next to a show. Everything is replaced and the lights follow straight away. Before loading, the state you had is kept as **Autosave**, so a show loaded by mistake can be undone by loading Autosave.
- **Export / import:** **Export** downloads a show as a `.lumaestro.json` file (**Export current** does this for the current state). **Import show file…** loads such a file and adds it to the list.
- **Delete:** ✕ removes a saved show.

> **Tip.** Save the show after the sound check, when the movement ranges, home positions and buttons are right. Changes you make during the evening are not saved in the show until you press **Save over**; Lumaestro itself always remembers the last state when you restart it.

21 Settings

The Settings tab has its own pages, chosen in the bar at the top (the page you used last opens again): **Shows** (save and load, see Saving and loading shows), **In & output** (Art-Net, sACN, USB DMX, music input, the tempo from the DJ, Philips Hue and Nanoleaf), **Show & home** (show settings and mover home positions), **Movement range**, **Custom buttons**, **Gamepad & MIDI**, **Passwords**, **PC power**, **Fixture library**, **Updates** and **Look & about**.

Art-Net output

- **Target IP**: the address of your Art-Net node, or the broadcast address of its network (ending in `.255`).
- **Universe offset**: added to every universe. Lumaestro universe 1 is Art-Net universe 0 + offset.
- **Frames per second**: how often DMX is sent (10–60, default 40).
- **Find nodes** asks the network which Art-Net nodes are there. Some cheap interfaces do not answer; they still work.
- **Send Art-Net** can be switched off when only sACN or USB dongles are used.

sACN (E1.31) output

sACN (streaming ACN, standard E1.31) is the other common way to send DMX over a network. WLED, pixel controllers, many nodes and lighting desks listen to it. Tick **Send sACN** and press **Save**:

- **Send to**: *Multicast* (every receiver on the network finds its universe by itself; the usual choice) or *One IP address* (unicast, for a receiver that wants it, or a network that blocks multicast).
- **Universe offset**: Lumaestro universe 1 is sACN universe 1 + offset.
- **Priority** (1–200, default 100): when two sources send the same universe, the receiver takes the higher priority.
- Art-Net, sACN and USB dongles can all run at the same time; the chip at the top shows both network outputs.

USB DMX dongles

Instead of, or next to, Art-Net, Lumaestro can send DMX straight out of a USB dongle. Each dongle carries one universe. Under **In & output** → **USB DMX dongles**:

1. Plug in the dongle and press 🔍 **Find dongles**. Click a found dongle to add it, or use **+ Add dongle**.

2. Choose the **type**, the **port** and the **universe** it sends (the same universe numbers as in the patch), then press **Save**.

TYPE	DONGLES
Enttec Pro compatible	Enttec DMX USB Pro and Pro Mk2 (first output), DMXking ultraDMX Micro and ultraDMX Pro, Eurolite USB-DMX512 PRO (MK2) and other "Pro compatible" interfaces. The dongle makes the DMX signal itself: the most reliable choice.
Open DMX / FTDI	Enttec Open DMX USB, Eurolite USB-DMX512 (without PRO) and the cheap "USB to DMX" cables and sticks with an FTDI chip. The PC makes the DMX signal; it works well, but timing depends on the PC.
uDMX	The Anyma uDMX and its clones. On Windows these need the WinUSB driver once: install it with the free tool Zadig (choose the uDMX, then WinUSB).

- **Channels** chooses how much of the universe goes out: *1–50*, *1–100* … *1–500* or *all 512*. Fewer channels means more frames per second, which matters most for a uDMX: it manages about 30 frames per second with all 512 channels, but more than 90 with 1–150. Choose the smallest step that still covers your patch; the row says how far the patch goes ("patch uses up to 118: 1–150 is enough") and warns when the step is too small for it.
- The status after each dongle shows the **frames per second** that go out now and, as *max*, what the dongle can do with this many channels. Lumaestro sends at most the *Frames per second* of the Art-Net settings (default 40).
- Port **Auto** finds the dongle by itself. Lumaestro also remembers the dongle's serial number, so it is found again when Windows gives it another COM port (another USB socket).
- An unplugged dongle is opened again by itself within a few seconds. The chip *USB DMX* at the top shows whether all dongles work; hover over it for details.
- A dongle can only be used by one program at a time. "Port is in use" means other lighting software still has it open.
- The dongle settings belong to this PC and are not part of shows.

Music input

- **Listen to audio** switches the music analysis on or off.
- **Input device**: the microphone or line-in that hears the music.
- **Sensitivity**: raise it when the energy bar hardly moves, lower it when it is always full.

Tempo from the DJ

The microphone hears the beat well, but the DJ's own software or players know it exactly. Choose where the beat comes from:

CHOICE	WHAT IT DOES
Off (music / TAP)	The tempo comes from the music and TAP, as always.
Ableton Link	Ableton Live, Traktor, Rekordbox, Serato, djay, Bitwig and many apps share their tempo and beat on the network with Link. Switch Link on in that program; Lumaestro finds it on the same network and shows how many Link programs it sees. It follows the tempo, the beat and beat 1 of the bar.
Pioneer Pro DJ Link	Pioneer CDJ / XDJ players and DJM mixers connected with network cables to a switch, with the Lumaestro PC on the same switch. On every beat they send the tempo (pitch included) and the beat of the bar. **Follow** chooses the player or mixer: *Automatic* takes the mixer (which sends the master tempo) or else the first player that plays.

- Lumaestro only listens: it never changes the DJ's tempo and does not join the Pro DJ Link network as a player, so it cannot disturb the DJ.
- The microphone still gives the energy and the drops. When the source stops sending (track paused, cable out), the beat clock simply runs on.
- TAP and the setlist BPM are ignored while the DJ leads; **1st beat** still works.

Philips Hue and Nanoleaf

Under **In & output** Hue lamps and Nanoleaf panels can join the show. Every lamp or panel becomes an ordinary RGB fixture in the patch, so groups, scenes, the programmer and the automatic show drive it like any DMX lamp.

- **Philips Hue:** enter the IP address of the Hue Bridge (or press 🔍 **Find bridge**, which needs internet), press the round button on the bridge and then **Pair** within 30 seconds. Lumaestro

lists the colour lamps; lamps without colour (white only, plugs) are left out and named.

- **Nanoleaf:** enter the IP address of the controller (in your router or the Nanoleaf app), hold its power button for 5–7 seconds until the lights flash and press **Pair** within 30 seconds. Lumaestro lists the panels.
- **Add to patch** makes a fixture (Generic RGB Fader, 3 channels) for every lamp or panel that has none, on a free universe. Put them in a group on the Patch tab like other fixtures. **Read again** picks up lamps or panels that were added later.
- The Hue Bridge takes about **10 changes per second** for all lamps together: Hue lamps follow colours and slow effects well, but not a fast strobe or a quick chase. Nanoleaf panels are streamed about 20 times per second, fast enough for effects on the beat.
- The pairing belongs to this PC (it is not saved in shows, and the keys are never sent to the browser). The fixtures themselves are part of the patch and the show.

Show

SETTING	MEANING
Change look every (bars)	How long a look plays with AUTO SHOW on (default 8 bars).
Start BPM	The tempo when Lumaestro starts.
Pan / tilt range (± degrees)	Movement size at 100% for fixtures without their own range.
Fade when auto changes look	Crossfade time between looks in seconds.
Looks per energy level	How many looks are generated for calm, groove and peak (4–32, default 12).
Strobe hit on detected drops	A short strobe on every drop (off by default).
Page Down / Page Up go through	The scenes (default) or the setlist: what Page Down / Page Up and a presentation clicker step through.
Generate new looks	Makes a completely new set of looks.

When Lumaestro starts

On the same page you choose what the lights do as soon as Lumaestro starts, before anybody touches anything. Handy for a PC that starts Lumaestro by itself with Windows.

MODE	WHAT HAPPENS
Show	Loads the chosen saved show (patch, groups, scenes, buttons and live settings as they were saved), so every evening starts the same. What you changed after saving is kept as **Autosave**, not lost.
Auto	AUTO SHOW plays straight away and follows the music. This is the default.
Blackout	The lights stay dark until you press **BLACKOUT**; then the auto show starts.
Scene	Puts the chosen scene on stage, for example a house light or a welcome look. It stays until you press AUTO SHOW or another scene.

When the chosen show or scene no longer exists, Lumaestro starts with AUTO SHOW. The choice belongs to this PC and is not part of shows.

Passwords

Protect the control page for phones, tablets and other computers on the network. There are two passwords, both optional:

- **Operate**: needed to use the Show tab at all (tempo, looks, scenes, buttons, master …). A device without it sees a login screen. Without this password everybody on the network can operate the show.
- **Edit**: needed for everything except Live control: the Scenes and Setlist pages, Patch, Fixture editor, Settings and arranging the live page, and to change looks, presets, positions, custom buttons and the preview layout. With only the operate password those tabs show a 🔒 and ask for the edit password. Without an edit password, whoever may operate may also edit.

Log in once per device: it stays logged in, also after a restart of Lumaestro, until you log out with the chip at the top (🔓 *Edit · log out*) or a password is changed (then every device logs in again). **On the Lumaestro PC itself** (http://localhost) no password is ever asked, so you can never lock yourself out. The PC power password below is separate. After 5 wrong passwords a device has to wait a minute.

PC power

Shut down or restart the PC that Lumaestro runs on, from any phone or tablet, with a password. Set the first password on the Lumaestro PC itself (open `http://localhost:8800` there) under **PC power → Set password**; after that it can be changed from anywhere with the current password, and an empty new password switches the function off. To use it, type the password and press ⏻ **Shut down PC** or ↻ **Restart PC**. The lights go to BLACKOUT first (Art-Net nodes keep the last values they got), then Windows waits 10 seconds; **Cancel shutdown** (with the password) stops it and brings the lights back. After five wrong passwords, that device has to wait a minute. The password is stored as a salted hash in `data\config.json`, is never sent to the browser and is not part of shows.

> To come back after a restart, let Lumaestro start with Windows: put a shortcut to `Lumaestro.exe` in the Startup folder (`Win` + `R` , `shell:startup`) and set Windows to sign in automatically.

Mover home positions, movement range, custom buttons

See Movement range and home and Custom buttons.

Updates

With **Look for a new version when Lumaestro starts** on (the default), Lumaestro asks qmix.nl a few seconds after it starts whether there is a newer version. If so, a green bar appears at the top of the control page: **Update now**, **Later** (asks again next start) or **Skip this version**. Nothing is downloaded or changed before you press Update now. Then Lumaestro downloads the new `Lumaestro.exe`, checks its size and SHA-256 checksum, swaps it with the running one and starts again; the lights are dark for a few seconds and the page reconnects by itself. The previous version stays next to it as `Lumaestro.exe.old` until the next start. **Check now** looks right away. Switch the option off for a rig that must never change during a season, or a PC without internet. When Lumaestro may not write in its folder (for example under Program Files), Update offers the download page instead.

Look & about

Choose **Dark** (easiest on the eyes in a dark room), **Light** (daylight, outdoors) or **Like this device** (follows the light or dark setting of the phone or computer). The choice is kept per browser, so every phone or tablet can have its own. The About panel shows the version and links to this manual (online and PDF) and the website. **Live page layout on this device** chooses the layout of the Show page (see Arrange the live page).

Fixture library

Shows how many definitions there are and where they are kept. **Update fixture library (add new)** looks in the Lumaestro library on qmix.nl/lumaestro/library and in the Open Fixture Library, and **only adds** fixtures you do not have yet. Nothing you have is replaced or removed, and your own definitions in `fixtures\mine` are never touched. A newer version of Lumaestro also adds the new fixtures from its built-in library on its first start. The sources are listed under `library_sources` in `data\config.json`. **Rescan fixture folders** reads both folders again, for example after you copied OFL `.json` files into `fixtures\mine` (with a matching entry in its `manufacturers.json`). Definitions from other programs can be converted to this format on the Open Fixture Library website.

22 Keyboard shortcuts

On the control page (not while typing in a field):

KEY	ACTION
Space	Tap tempo (the first tap is beat 1)
1	1st beat: the beat you hear now is beat 1 of the bar (unless a custom button uses the key 1)
F **(hold)**	Flash
S **(hold)**	Strobe
Page Down / Page Up	Next / previous scene, or next / previous song when Settings → Show & home says so (also from a presentation clicker)
Your own key	The custom button it is assigned to (hold for Flash buttons)
Gamepad / MIDI	Whatever you learned under Gamepad and MIDI

Avoid giving a custom button the keys F, S or B.

23 Safety

- Maintenance, reset and lamp channels are always 0, and built-in auto or sound programs are never started.
- Fog runs only while FOG is held and stops after 15 seconds; flash and strobe holds stop after 60 seconds.
- Holds and Flash buttons are released when the device that holds them disconnects.
- Effect devices (sparks, lasers, flames, confetti) are never used by the automatic show; only your custom buttons fire them, preferably with a safety limit.
- BLACKOUT switches everything off, custom buttons included.
- Auto strobe on drops is off by default; think of guests who are sensitive to flashing light before switching it on.
- Set the movement range of every moving head so it cannot point into the audience's eyes.
- When Lumaestro stops, all channels go to 0.

24 Art-Net Viewer

Lumaestro Viewer is a separate, free program that shows what really arrives on the network as Art-Net, from Lumaestro or from any other Art-Net program. It listens on UDP port 6454, decodes the channels with the fixture definitions and draws the stage: colour, dimmer, pan and tilt (left / right and to the back or front, with the circle where the light lands), gobo, prism and a simulated strobe. Fixtures with several lamps in one unit (Design) show every lamp in its own colour. Use it to check a show without the lights, or to find out why a light does not do what you expect.

Put `LumaestroViewer.exe` in a folder you can write to and double-click it. Its status window opens and the browser shows `http://localhost:8810`. The window shows whether Art-Net arrives (universes with their frames per second, which computers send it), where the patch comes from, how many fixtures are patched and a log; **Open viewer page** opens the page again and closing the window (or **Quit viewer**) stops the viewer. Start it with `--console` for the old console window instead.

Updates. A few seconds after it starts, the viewer asks qmix.nl whether there is a newer version (switch this off with *Look for a new version when the viewer starts*). When there is one, the window says so and **Update now** downloads it, checks its size and SHA-256 checksum, swaps it with the running `LumaestroViewer.exe` and starts the new viewer; the old one stays next to it as `LumaestroViewer.exe.old` until the next start. **Check now** looks right away. Viewers older than 1.3.4 cannot update themselves yet: download that version once from the website. On the first start it unpacks its own fixture library. In the same folder as `Lumaestro.exe` it shares the `fixtures` folder and finds your shows in `data\shows`. Its own settings and patch are kept in `data\viewer.json`.

> **Same PC as Lumaestro.** Art-Net sent only to the node's own address does not reach a viewer on another PC. Set Lumaestro's Art-Net target to the broadcast address of the network so the node and the viewer both receive it, or to `127.0.0.1` to try a show on one PC without lights.

Patch tab

- **Own patch:** add fixtures from the library with mode, name, count, **universe** and start address. The universe is the Art-Net port address 0–32767 (shown as net.sub.universe). The next free

address is suggested, and overlapping addresses are marked.

- **Load a Lumaestro show** (`.lumaestro.json` , or one of the shows in `data\shows`): the patch and stage layout are taken over, the universe offset is added and the show's own fixture definitions are installed.
- **Follow Lumaestro live:** take the patch from a running Lumaestro (its address, e.g. `http://localhost:8800`), and copy it to the own patch when you want to keep it.
- **Export / Import** saves and loads the viewer patch as a file.

Fixtures tab

Make a fixture by listing its channels in order (drag a channel by its ⠿ handle to change the order) and choosing a function for each one; for a colour or gobo wheel type the slots, for example *Open, Red, Green*. Templates are ready for an RGB par, a dimmer, Dim+RGBW+strobe and moving head spot/wash. Fixture files in Open Fixture Library or Lumaestro format (.json or .zip) can be imported. Your fixtures are saved in `fixtures\mine` ; next to Lumaestro they are the same fixtures Lumaestro uses.

Viewer tab

The stage with **Edit layout** (place the fixtures like the real stage, same layout as Lumaestro), a DMX monitor per universe and the channel values of the selected fixture. When two programs send to the same universe the values mix; the viewer warns about it and lets you choose which **sender** to show.

25 Files and backups

FILE	CONTENTS
`data\config.json`	All settings, including the custom buttons.
`data\patch.json`	The patch, with the movement range per fixture.
`data\groups.json`	The groups with their manual settings and home positions.
`data\shows\`	Your saved shows, one `.json` file per show (including Autosave).
`fixtures\mine\`	Your own fixture definitions (Open Fixture Library JSON).
`fixtures\library\`	The fixture library (more than 2,200 fixtures). New fixtures are only added, never replaced. Delete the folder to unpack the built-in version again on the next start.

Copy the `data` folder and `fixtures\mine` to back up a complete setup or to move it to another PC, or use **Export all** in the fixture editor and **Export** in Settings → Shows. The files are created on the first start; delete one to go back to its defaults.

26 Troubleshooting

The lights do not react

- Is another lighting program still running? Close it.
- Check the **Art-Net** chip at the top of the page or in the status window. Is the target address right? Try the broadcast address of the node's network.
- Do the fixture addresses and modes in the patch match the settings on the fixtures themselves?
- Is the Master, the group level or BLACKOUT keeping the light off?

Audio: silent

The input works but hears nothing. Choose another input device under Settings, turn up the sensitivity or move the microphone closer to the speakers. Without audio, use TAP and fix the energy level by hand.

A fixture is "not recognised" or "missing"

Open it with **Edit fixture**. Check what Lumaestro sees per mode and describe the channels or add the value ranges. A missing fixture needs a new definition with the same manufacturer and model name.

I cannot put a fixture in a group

Only recognised fixtures can be grouped. See above.

The colours are wrong on a colour wheel fixture

The wheel ranges in the definition probably have no colours. Open the fixture in the editor and give each colour range its colour.

Moving heads move the wrong way

Tick **Inv pan** or **Inv tilt** for that fixture in the patch table, and set its movement range.

Pan / tilt fine channels jump wildly in an Art-Net monitor

That is normal. Lumaestro sends pan and tilt in 16 bits, split over two channels: the coarse channel moves in 256 steps across the whole range (more than 2° per step on a 540° pan), and the **fine** channel divides each of those steps into 256 more. While a head moves, the fine channel runs from 0 to 255 and back to 0 at every coarse step, often dozens of times a second. In the Art-Net Viewer or another monitor that looks like random flickering, but together the two channels form one smooth value. Without the fine channel slow movements would visibly step.

Only when a head stands **still** should the fine channel stay still too. If it keeps moving while the head is not moving, something is wrong: note which look or preset is running and report it.

The control page does not open on my phone

Use the phone/tablet address from the status window, make sure the phone is on the same network, and allow Lumaestro through the Windows firewall (private networks).

"Port 8800 is already in use"

Lumaestro is already running (look for its window or its icon in the taskbar). Or another program uses the port: start Lumaestro with `Lumaestro.exe --port 8900`.

The programmer does nothing

Is AUTO SHOW on? Then the groups follow the automatic show and the programmer is paused (a banner says so). Switch AUTO SHOW off, or pin (📌) the group you want to program. Also check that at least one group is selected.

The moving heads ignore the Aim pad

Aim only works on fixtures with pan and tilt (role Mover). Check that the right groups are selected (no selection = all moving heads), that MOVE is on, and that the movement range is not a tiny box.

My MIDI controller does nothing

- Look at the status line under Settings → Gamepad & MIDI: is the device listed? If not, check the cable and whether another program (DAW, other browser tab) has it open – a MIDI device can only be used by one program at a time.
- In *This browser* mode press **Connect MIDI** and allow MIDI for the page; use Chrome or Edge.

- Press a button and watch "Last:" in the status line: if nothing appears, the controller sends nothing (some controllers need a template or mode on the device itself).

The buttons on my controller do not light up

Check the **Button lights** list: if the device is "not recognised", choose its type or *Generic*. A Launchpad in the browser needs the SysEx permission (asked once). On a nanoKONTROL2, set LED Mode to External in the Korg editor. Lights only show for buttons that have an action learned.

The update did not work

The bar tells why. Nothing was changed: the running version stays. Common causes are no internet, a firewall or proxy, or a folder Lumaestro may not write in (then Update offers the download page). You can always download the new `Lumaestro.exe` from qmix.nl and replace the old one by hand while Lumaestro is closed.

The preview stays empty

Press **Show preview**. When it is popped out into its own window, the preview on the Show tab is folded away; close the pop-out window to get it back.

27 Words used in this manual

WORD	MEANING
DMX	The signal that controls stage lights: up to 512 channels per cable, each 0–255.
Universe	One set of 512 DMX channels (one DMX line). Bigger rigs use several universes.
Art-Net	DMX sent over a computer network. An Art-Net node turns it back into DMX for the lights.
Address	The first DMX channel of a fixture; it uses that channel and the ones after it.
Mode	The channel layout a fixture is set to (for example 7 or 16 channels). Must be the same on the fixture and in the patch.
Patch	The list of fixtures with their mode, universe and address.
Fixture definition	The description of what every channel of a fixture does (Open Fixture Library JSON).
Group	Fixtures that are programmed together, for example all moving heads.
Layer	One part of what a group does: Move, Colour, Intensity or Beam.
Look	A complete automatic picture: movement, colours, intensity and beam for every kind of fixture.
Preset	Stored layer settings of one group, to load onto groups.
Scene	The whole stage at one moment (all groups), to go to or play in order.
Aim position	Stored points where the moving heads shine, for solos.
Beat, bar, phrase	A beat is one count of the music; a bar is 4 beats; a phrase is a number of bars (8 by default) after which AUTO SHOW changes look.
BPM	Beats per minute: the tempo.
Drop	The moment the beat comes back hard after a quiet build-up.

Pan, tilt	Left-right and up-down movement of a moving head.
Gobo, prism	A pattern plate in the beam, and a glass that splits the beam into several.
CCT, Kelvin	Colour temperature of white light: 2700 K is warm, 6500 K is cold.
Crossfade	A smooth change from one setting to the next over a fade time.

28 Index

Every subject of this manual from A to Z. Click a word to jump to where it is explained (also in the PDF). On screen, the search box at the top of the contents finds any other word.

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